

CLASSIFICATION OF THE WEEVIL SUBFAMILY
TYCHIINAE, WITH A NEW GENUS AND SPECIES,
NEW COMBINATIONS, AND NEW SYNONYMY IN
LIGNYODINI (COLEOPTERA: CURCULIONIDAE)

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ABSTRACT

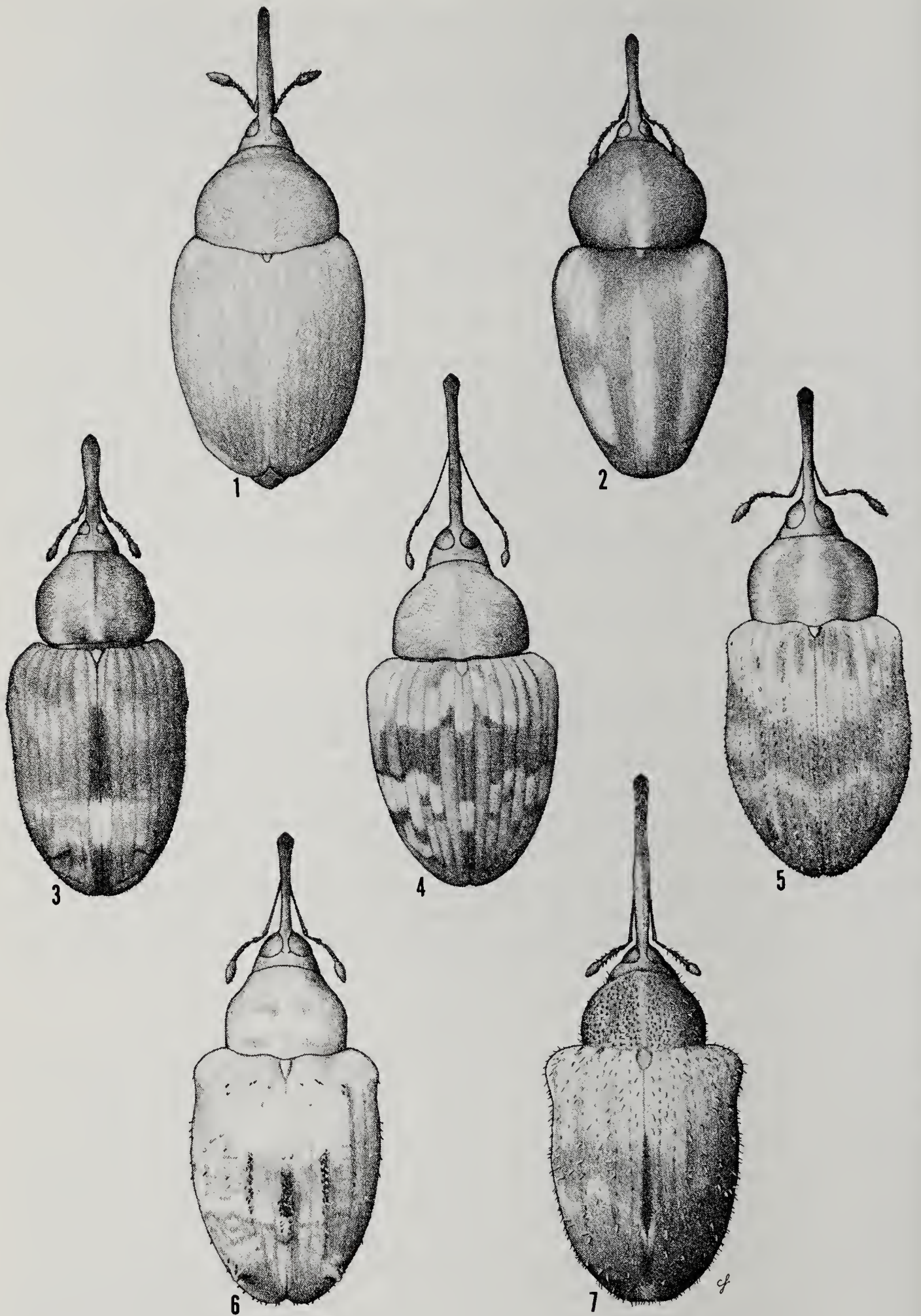
Thysanocnemis LeConte is placed in synonymy with *Lignyodes* Dejean, and *L. slovaticus* Dieckmann is placed in synonymy with *L. bischoffi* (Blatchley). The monobasic genus *Rosella* and its type-species *R. sickingiae* (Costa Rica and Guyana, in fruits of *Sickingia maxonii* Standley, Rubiaceae) are described by Whitehead as new. The subfamily Tychiinae is classified as 4 tribes: Tychiini, Lignyodini, Endaeini, and Elleschini. Lignyodine genera are keyed and illustrated. *Neotylopterus graphicus* (Casey) and *N. yavapaiensis* (Sleeper) are new combinations, transferred from *Thysanocnemis*.

INTRODUCTION

Kissinger (1962) listed characters by which *Tychius* Germar, *Sibinia* Germar, *Paragoges* LeConte, *Miccotrogus* Schönherr, *Mecynopyga* Pierce, and *Itychus* Kissinger are distinguished from *Chionanthobius* Pierce, *Elleschus* Stephens, *Hamaba* Casey, *Neotylopterus* Hustache, *Plocetes* LeConte, *Proctorus* LeConte, and *Thysanocnemis* LeConte. Later (1964) he restricted Tychiinae to include only the former 6 genera by transferring the others, along with *Ochyromera* Pascoe and *Eucllyptus* Dietz, from Tychiinae to the tribe Endaeini in the subfamily Anthonominae. Burke (1973:179), however, listed characteristics distinguishing anthonomines from some endaeines and later (1976:285) excluded Endaeini from Anthonominae. Thus, the status and placement of Endaeini (*sensu* Kissinger) were left in question.

Our interests in endaeine relationships arose independently: Clark, to find the sister group of Tychiinae (*sensu* Kissinger); Whitehead, to describe and place a new genus and species from tropical America; and Warner, to determine the status of *Eucllyptus* Dietz. Champion (1902:141) listed *Eucllyptus* in synonymy with *Phyllotrox* Schönherr, a genus of Erirhininae. Warner (in press) verified this synonymy, and thus *Eucllyptus* is removed from Endaeini. The other endaeine genera (*sensu* Kissinger) are treated herein as Tychiinae (*s. l.*). We recognize 4 tribes of Tychiinae: Tychiini, Lignyodini, Endaeini, and Elleschini; the latter 3 tribes contain the remaining genera of Kissinger's Endaeini. We review relationships among these tribes, relationships among genera of Lignyodini, and, in less detail, relationships among genera assigned to Endaeini and Elleschini. In addition, we present some new generic synonymy and new species combinations in Lignyodini, along with descriptions of a new genus and species in that tribe.

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Figs. 1-7, dorsal view, female: 1) *Sibinia viscaria*; 2) *Tychius quinquepunctatus*; 3) *Plocetes ulmi*; 4) *Chionanthobius schwarzi*; 5) *Lignyodes bischoffi*; 6) *Neotylopterus pallidus*; 7) *Rosella sickingiae*.

Specimens studied for this paper are in the USNM; Costa Rican material of the new species was provided by D. H. Janzen, University of Michigan. Illustrations were prepared by I. C. Feller. Partial funding was from Janzen's NSF grants GB 35032X and BMS 75-14268. Some host information was obtained by Clark on a trip funded in part by the American Philosophical Society, Penrose Fund. We thank H. P. Stockwell for assistance in collecting in Panama, and Tom Croat for identifying weevil host plants collected there.

NEW SYNONYMY

In 1973 L. Dieckmann sent a series of *Lignyodes slovacicus* Dieckmann from Czechoslovakia to Warner who recognized the species as the North American *Thysanocnemis bischoffi* Blatchley, apparently introduced into Europe; *L. slovacicus* Dieckmann 1970:97-100 is accordingly placed in synonymy with *T. bischoffi* Blatchley 1916:240-241, **new synonymy**.

This synonymy brings into question the status of *Lignyodes* Dejean and *Thysanocnemis* LeConte as valid genera. Dieckmann (*in litt.*) stated that after examination of specimens of *T. fraxini* LeConte (type-species of *Thysanocnemis*) he would not hesitate to place the species in *Lignyodes*. Comparison of specimens of the type-species of *Lignyodes*, *L. enucleator* (Panzer), with *T. fraxini* leaves no doubt that they are congeneric; *Thysanocnemis* LeConte 1876:214 is therefore placed in synonymy with *Lignyodes* Dejean 1835:278, **new synonymy**.

Workers, including Dieckmann (1970), have generally cited Schönherr as author of *Lignyodes*, but the name should be attributed to Dejean. Nomenclature is as follows:

Lignyodes Schönherr 1833:19. A *nomen nudum* because neither description nor definition was given and because the only included species, *Elleschus bicolor* (Duftschmid), is itself a *nomen nudum* (Sherborn 1922:717).

Lignyodes Dejean 1835:278. Type-species, *Curculio enucleator* Panzer, by monotypy. Art. 16(a) (v).

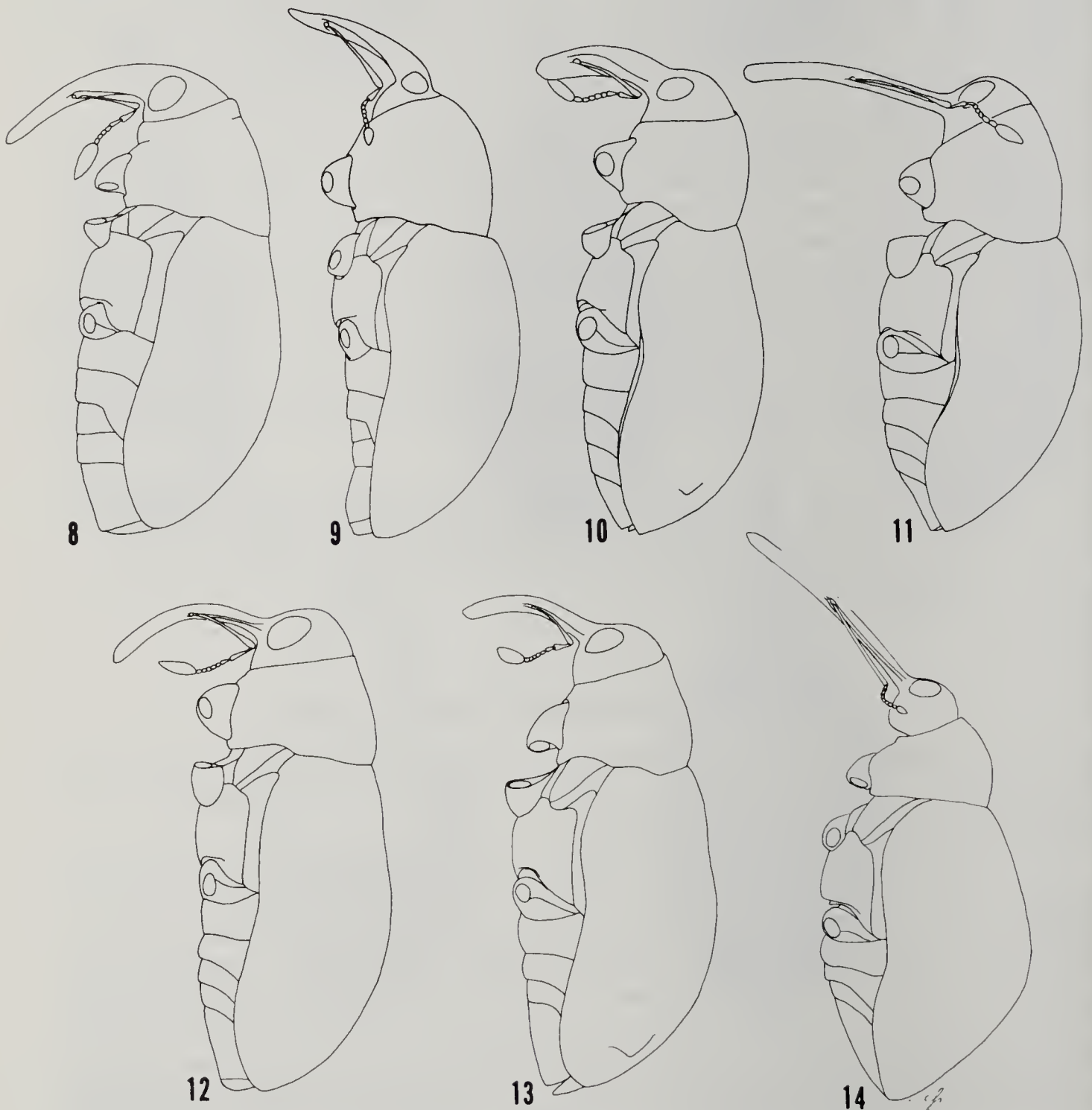
GENERIC AND SUPRAGENERIC RELATIONSHIPS

From examination of characteristics of representatives of North American genera assigned by Kissinger (1964) to Endaeini and Tychiinae (*s. str.*), we observe the following relationships:

A. Tychiinae *s. str.* members (figs. 1, 2, 8, 9, 15, 37) share the following apparently apomorphic (derived) character states, indicating that the included taxa form a monophyletic group: (1), sides of abdominal sternum 2 strongly angled posteriorly, covering sides of sternum 3 completely and sternum 4 in part, suture between sterna 3 and 4 nearly straight (fig. 22); and (2), spiculum gastrale Y-shaped, spiculum rod short with its apex not reaching apex of tegminal strut (figs. 42-43, *Tychius* and related genera) or spiculum gastrale composed of 3 plates and spiculum rod absent (figs. 44-45, *Sibinia* and related genera). These characteristics are diagnostic of the tribe Tychiini, as treated herein; distribution, fig. 51.

B. The genera *Lignyodes*, *Neotylopterus*, *Chionanthobius*, *Plocetes*, and *Hamaba* share the following apparently apomorphic character states

with *Rosella*, new genus, indicating that they together form a monophyletic group: (3), eyes large, close together, more or less directed forward (figs. 3-7); (4), origin of rostrum from frons abrupt in most forms (figs. 10-14); (5), scrobe parallel with rostrum, reaching eye, not directed ventrad (figs. 17-21) except in *Plocetes* (fig. 16); (6), elytra with basal fascia of pale scales, broad median transverse band of dark scales, and narrower band of light scales posterior to dark band (figs. 4, 6, 7), pattern modified but similar in *Plocetes* (fig. 3), *Hamaba*, and most *Lignyodes* (fig. 5); (7), sutural intervals with black, usually erect scales (recumbent in *Chionanthobius*, absent in *Hamaba* and most *Lignyodes*); and (8), pygidium of male large, broadly convex (figs. 35-36), with large lateral swellings in *Rosella* and smaller swellings in *Neotylopterus*. These characteristics are diagnostic of the tribe Lignyodini, as treated herein; distribution, fig. 52.



Figs. 8-14, lateral view female: 8) *Sibinia viscaria*; 9) *Tychius quinquepunctatus*; 10) *Plocetes ulmi*; 11) *Chionanthobius schwarzi*; 12) *Lignyodes bischoffi*; 13) *Neotylopterus pallidus*; 14) *Rosella sickingiae*.

C. Tychiini and Lignyodini members share the following apparently apomorphic character states, indicating a sister group relationship: (9), sides of abdominal sternum 2 broadly curved (Lignyodini) or angled (Tychiini) posteriorly (figs. 22-27) (in Lignyodini the sides of sternum 3 are also curved posteriorly so the sides of sternum 2 do not cover them, but the structure of sternum 2 in Lignyodini is quite similar to that in Tychiini); (10), tegmen Y-shaped, without dorsal sclerotized components [Morimoto (1962a) stated that the cap-piece of the tegmen is vestigial or absent in several different Curculionidae without stating which ones, and he indicated a parallel development in Platypodidae. Bruhn (1947) noted a Y-shaped tegmen in some members of the subfamilies Hyperinae, Cryptorhynchinae, Ceutorhynchinae, and Anthonominae, but this condition does not characterize all members of these groups (cf. Burke 1959)]; (11), median struts freely articulated with base of median lobe (figs. 40-45) [Morimoto (1962a) stated that the mode of attachment of median struts in Curculionidae is variable, without specifying how or in which groups. Bruhn (1947) noted that some members of the subfamilies Hyperinae and Ceutorhynchinae also have freely articulated median struts and that the struts are "lightly attached" in *Anthonomus eugenii* Cano, Anthonominae. In *Rosella* the struts are connected to the median lobe but appear to be free because of lack of sclerotization at the points of attachment]; (12), tarsal claws subparallel at base, gradually divergent, basal processes elongate, slender [the tarsal structure of Lignyodini (fig. 32) is more or less intermediate between that of Tychiini (fig. 33) and that of *Ochyromera* (fig. 31) and *Proctorus* (fig. 30) which have widely divergent claws, each with a large, broad, flat basal process].

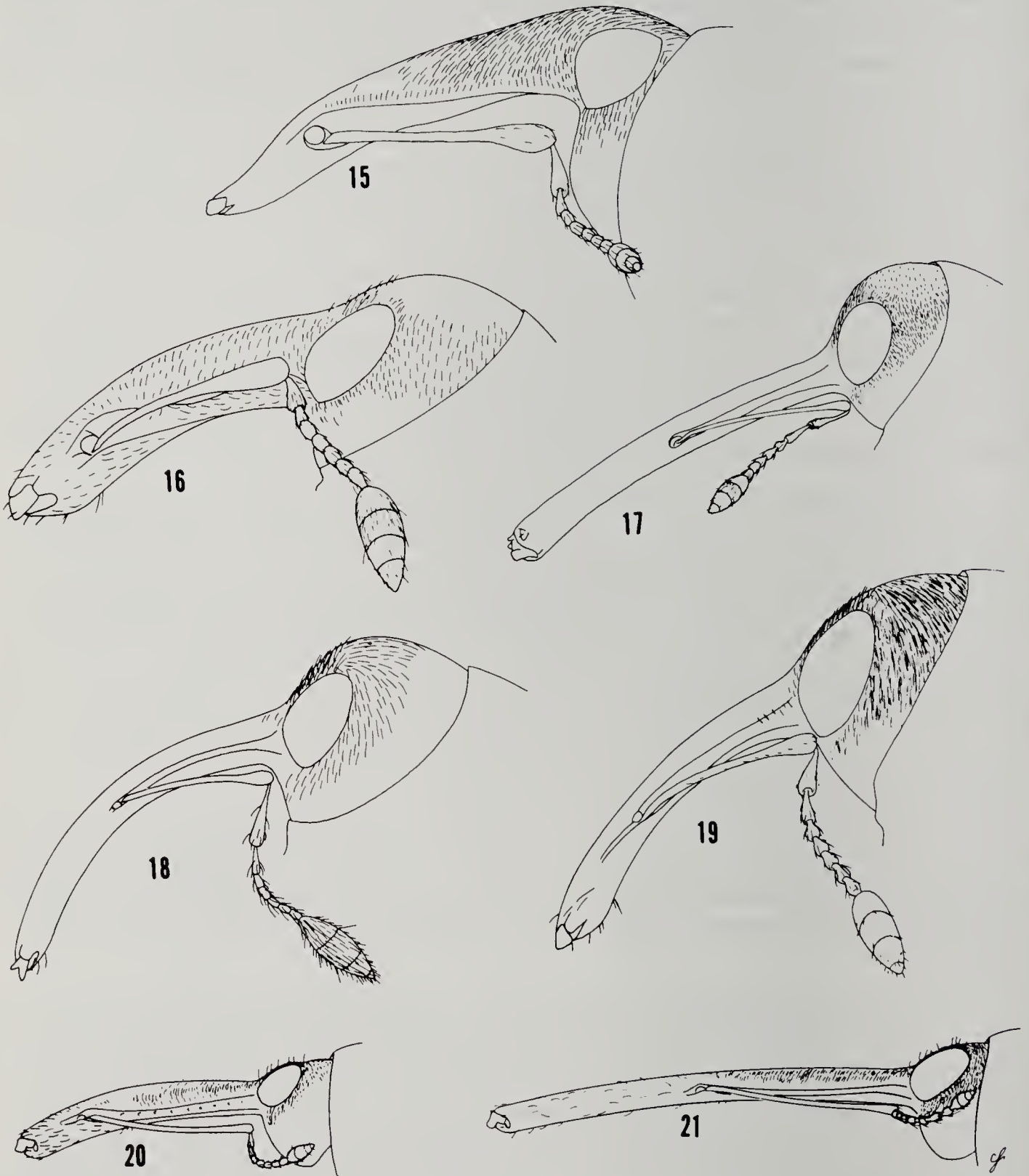
D. The genus *Ochyromera* shares the following apparently apomorphic character states with Tychiini and Lignyodini, indicating a sister group relationship: (13), male pygidium exposed beyond elytral apices (fig. 34-37); (14), tegmen with complete dorsal sclerotized ring but lacking additional dorsal sclerotized components (this possibly represents an intermediate stage in reduction toward complete loss of dorsal sclerotized components in Lignyodini and Tychiini, but see 10 above; we examined only *O. ligustri* Warner); (15), elytra with prominent posterior tubercles (reduced in *Lignyodes*, *Hamaba*, and Tychiini). In addition, the hosts of *Ochyromera ligustri* (*Ligustrum japonicum* Thunb., *L. lucidum* Ait., *L. amurense* Carr., and *Syringa* spp.) belong to the plant family Oleaceae, as do hosts of most Lignyodini. We assign *Ochyromera* to the tribe Endaeini, following Schenkling and Marshall (1936: 7), Voss (1958), and Morimoto (1962b). According to Morimoto (1962b) some Endaeini do not have the pygidium exposed.

E. The genera *Elleschus* and *Proctorus* share the following apparently apomorphic character states with Endaeini, Lignyodini, and Tychiini, indicating a possible sister group relationship: (16), sides of abdominal sternum curved posteriorly, to nearly the same degree in these genera (fig. 29) and in Endaeini (fig. 28) but less so than in Lignyodini (figs. 23-27); (17), scales on pronotum with apices directed toward midline. Here, we follow Thomson (1859) and Morimoto (1962b) in assigning *Elleschus* to the tribe Elleschini. Relationships of *Elleschus* and *Proctorus* are discussed below.

These views on relationships are summarized in diagrammatic form as a reconstructed phylogeny (fig. 53).

CLASSIFICATION OF TYCHIINAE

The following classification is based on what we believe to be probable phylogenetic relationships of the included genera. We have examined representatives of all genera of the tribes Elleschini, Lignyodini, and Tychiini, but our concept of the tribe Endaeini is based solely on examination of *Ochyromera* spp., especially *O. ligustri*, and a few *Endaeus* spp. The other genera listed below for Endaeini are from Schenkling and Marshall (1936), Voss (1958), and Morimoto (1962b); Morimoto also recognized a tribe Deminaeini for the genus *Deminaea* Pascoe, but we have not examined rep-



Figs. 15-21, lateral view of head: 15) *Tychius quinquepunctatus*, female; 16) *Plocetes ulmi*, female; 17) *Chionanthobius schwarzi*, female; 18) *Lignyodes bischoffi*, female; 19) *Neotylopterus pallidus*, female; 20) *Rosella sickingiae*, male; 21) same, female.

representatives of this genus. We are more confident of the existence of a sister group relationship between Lignyodini and Tychiini than of the nature of relationships of Elleschini and Endaeini. A more detailed review of the relationships of these taxa to other Curculionidae is needed. We feel, however, that the present arrangement represents the relationships of these taxa more accurately than does Kissinger's (1964) system.

Subfamily TYCHIINAE

Tribe ELLESCHINI

Genus *Elleschus* Stephens *Proctorus* LeConte

Tribe ENDAEINI

Genus *Drepanoscelus* Marshall *Omphasus* Pascoe
Endaenidus Morimoto *Synnada* Heller
Endaeus Schönherr *Menecopes* Faust
Exochyromera Voss *Neochyromera* Heller
Eusynnada Heller *Odontobaris* Faust
Gryphorhynchus Roelofs *Sphinxoides* Voss and Chujo
Heterendaeus Morimoto *?Sphinxus* Roelofs
Nesendaeus Marshall *Zeione* Pascoe
Ochyromera Pascoe *Jezene* Heller
Opeoscapha Faust

Tribe LIGNYODINI

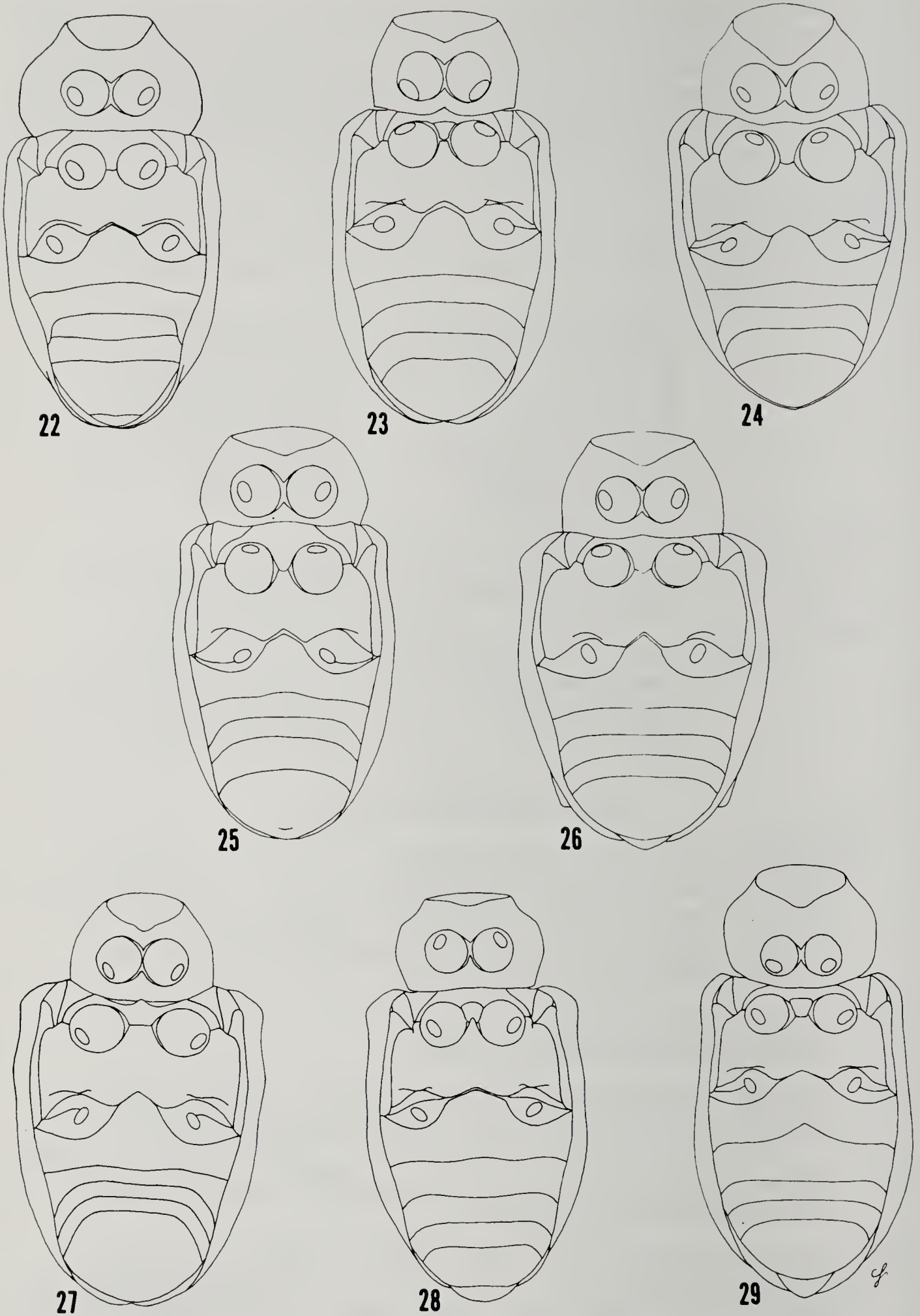
Genus *Lignyodes* Dejean *Neotylopterus* Hustache
Chionanthobius Pierce *Plocetes* LeConte
Hamaba Casey *Rosella*, new genus

Tribe TYCHIINI

Genus *Apeltarius* Desbrochers *Dichotychius* Bedel
Xenotychius Reitter *Mecynopyga* Pierce
Tychius Germar *Itychus* Kissinger
Sibinia Germar *Paragoges* LeConte

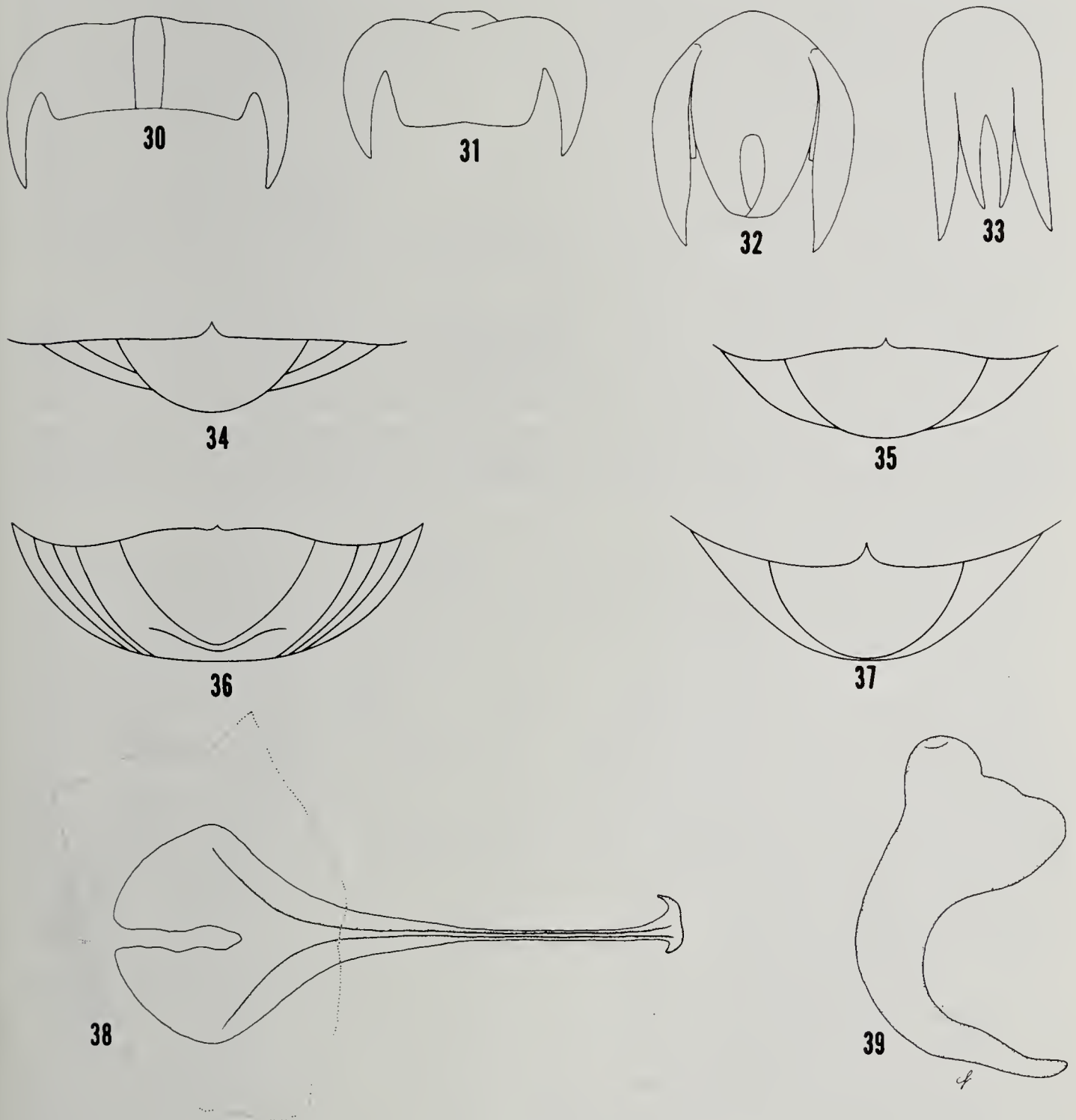
THE GENERA OF LIGNYODINI

1. Rostrum short, coarsely sculptured, not strongly sexually dimorphic, scrobe strongly descending *Plocetes* LeConte
- 1'. Rostrum long, finely sculptured, strongly sexually dimorphic, scrobe longitudinal or if descending then at least nearly parallel to long axis of rostrum 2
- 2(1'). Subapical elytral tubercles prominent 3
- 2'. Subapical tubercles feeble or absent 5
- 3(2). Sternum 5 longer than sterna 2-4 combined; female antenna inserted at midrostrum; femur armed with minute tooth.....
..... *Rosella*, new genus
- 3'. Sternum 5 shorter than sterna 2-4 combined; character combination otherwise not as above..... 4
- 4(3'). Femur unarmed; elytra with erect as well as recumbent scales *Neotylopterus* LeConte
- 4'. Femur armed with minute tooth; scales on elytra uniformly recumbent *Chionanthobius* Pierce
- 5(2'). Small species, 1.44-1.59 mm. in length, Bahama Islands and Florida *Hamaba* Casey
- 5'. Larger species, North, Central, and South America and Eurasia *Lignyodes* Dejean



Figs. 22-29, ventral view, female: 22) *Tychius quinquepunctatus*; 23) *Plocetes ulmi*; 24) *Chionanthobius schwarzi*; 25) *Lignyodes bischoffi*; 26) *Neotylopterus pallidus*; 27) *Rosella sickingiae*; 28) *Ochyromera ligustri*; 29) *Proctorus armatus*.

Genus *Lignyodes* Dejean. Type-species, *L. enucleator* (Panzer). See figs. 5, 12, 25 for dorsal, lateral, and ventral views of female and fig. 18 for lateral view of rostrum of female of *L. bischoffi* (Blatchley). Characteristics are various, as noted in previous discussion; *Lignyodes* members variously have symmetric or asymmetric male genitalia, and the genus may therefore be paraphyletic. Distribution, fig. 52; 29 species are assigned to *Lignyodes*—4 from Eurasia (Dieckmann 1970), 8 from the United States, 1 from Mexico and Belize, 6 from Guatemala, 1 from Nicaragua, 4 from Panama, 2 from Venezuela, 2 from Peru, and 1 from Brazil (Klima 1934). Known hosts of North American and European species are members of *Fraxinus* (Oleaceae).



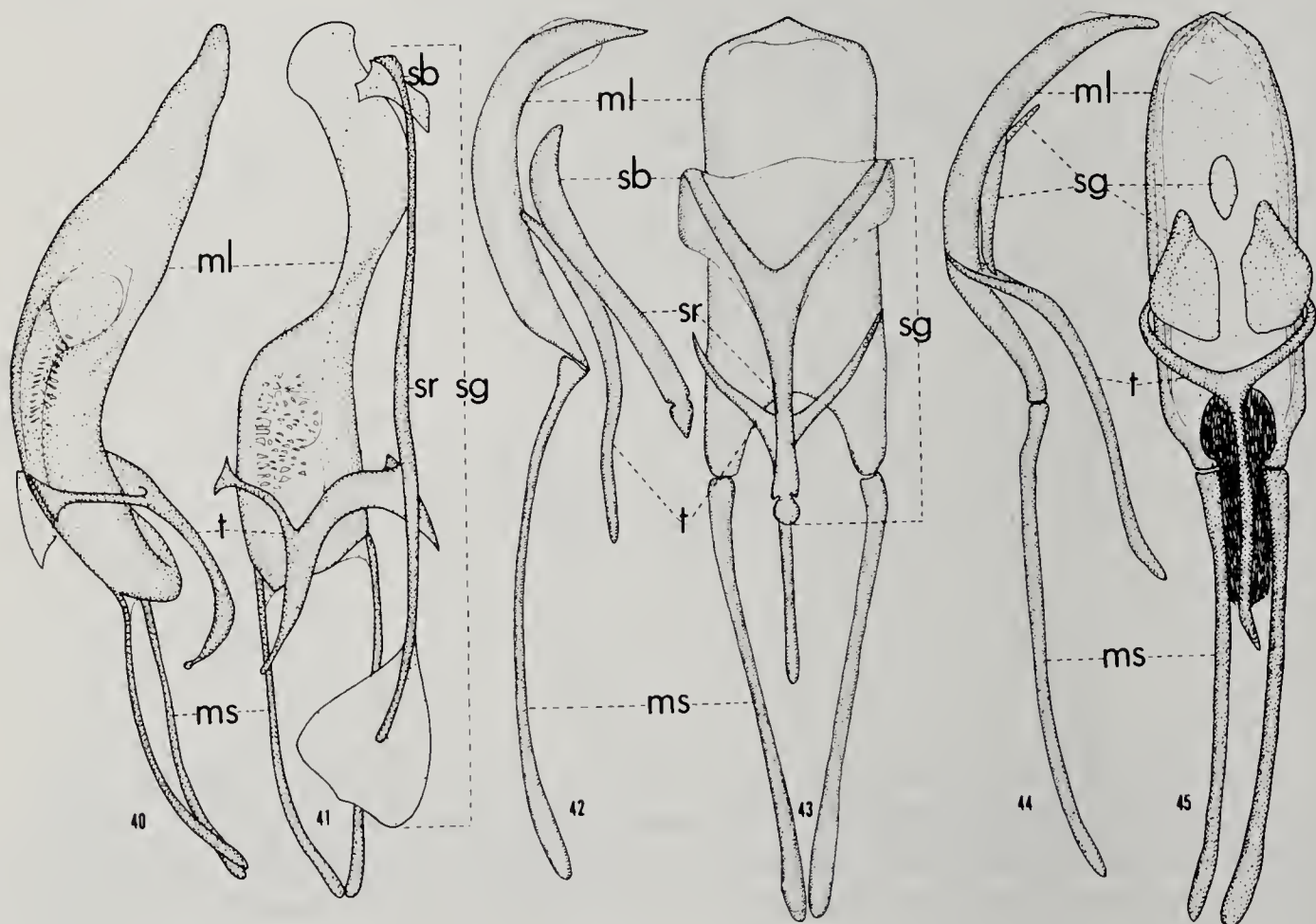
Figs. 30-33, tarsal claws: 30) *Proctorus armatus*; 31) *Ochyromera ligustri*; 32) *Lignyodes bischoffi*; 33) *Tychius quinquepunctatus*. Figs. 34-37, male pygidium: 34) *Ochyromera ligustri*; 35) *Lignyodes bischoffi*; 36) *Rosella sickingiae*; 37) *Tychius quinquepunctatus*. Figs. 38-39, *Rosella sickingiae* female: 38) spiculum ventrale; 39) spermatheca.

An unidentified Panamanian species was reared from seeds of *Macrocnemum glabrescens* (Benth.) Wedd. (Rubiaceae) collected on Barro Colorado Island, Canal Zone, by H. P. Stockwell. Clark collected adults of another unidentified species on *Rondeletia buddleioides* Benth. (Rubiaceae) at Cerro Campana, Panama. Hosts of other neotropical species are unknown.

Genus *Hamaba* Casey. Type-species, *H. bahamensis* Casey. We have not illustrated this genus here; the hind tibia lacks a spine, but *Hamaba* is not otherwise structurally different from *Lignyodes* s. l. Distribution, fig. 52; 2 included species, Bahama Islands and Florida. Host unknown.

Genus *Neotylopterus* Hustache. See figs. 6, 13, 26 for dorsal, lateral, and ventral views of female and fig. 19 for lateral view of female rostrum of *N. pallidus* (LeConte), the type-species. Characteristics are given in previous discussion and key. Distribution, fig. 52; previously assigned species are *N. pallidus*, *N. varius* (LeConte), and *N. baboquivariensis* Sleeper from the United States and *N. ligeri* (Hustache) from Bolivia. Two additional species, previously placed in *Thysanocnemis*, also have characteristics of *Neotylopterus*: *N. graphicus* (Casey 1892:425), **new combination**, and *N. yavapaiensis* (Sleeper 1954:120), **new combination**; Sleeper (1954) compared *N. yavapaiensis* with *N. graphicus* in his original diagnosis. Known hosts are various species of *Forestiera* (Oleaceae).

Genus *Chionanthobius* Pierce. Monobasic. See figs. 4, 11, 24 for dorsal, lateral, and ventral views of female and fig. 17 for lateral view of female rostrum of *C. schwarzi* Pierce. Characteristics are given in previous discussion and key. Distribution, fig. 52. *C. schwarzi* develops in seeds of *Chionanthus virginicus* L. in eastern North America; other species of *Chionanthus* (Oleaceae) occur in China.



Figs. 40-45, male genitalia, lateral and ventral: 40-41) *Rosella sicklingiae*; 42-43) *Tychius quinquepunctatus*; 44-45) *Sibinia viscaria*.

Genus *Plocetes* LeConte. Monobasic. See figs. 3, 10, 23 for dorsal, lateral, and ventral views of female and fig. 16 for lateral view of female rostrum of *P. ulmi* LeConte. Characteristics are given in previous discussion and key. Distribution, fig. 52. Host unknown; records from *Ulmus* are unverified; *Cephalanthus* (Rubiaceae) is the suspected host (Blatchley 1916).

Rosella Whitehead, new genus

Type-species. *R. sickingiae* Whitehead, new species, by present designation and monotypy.

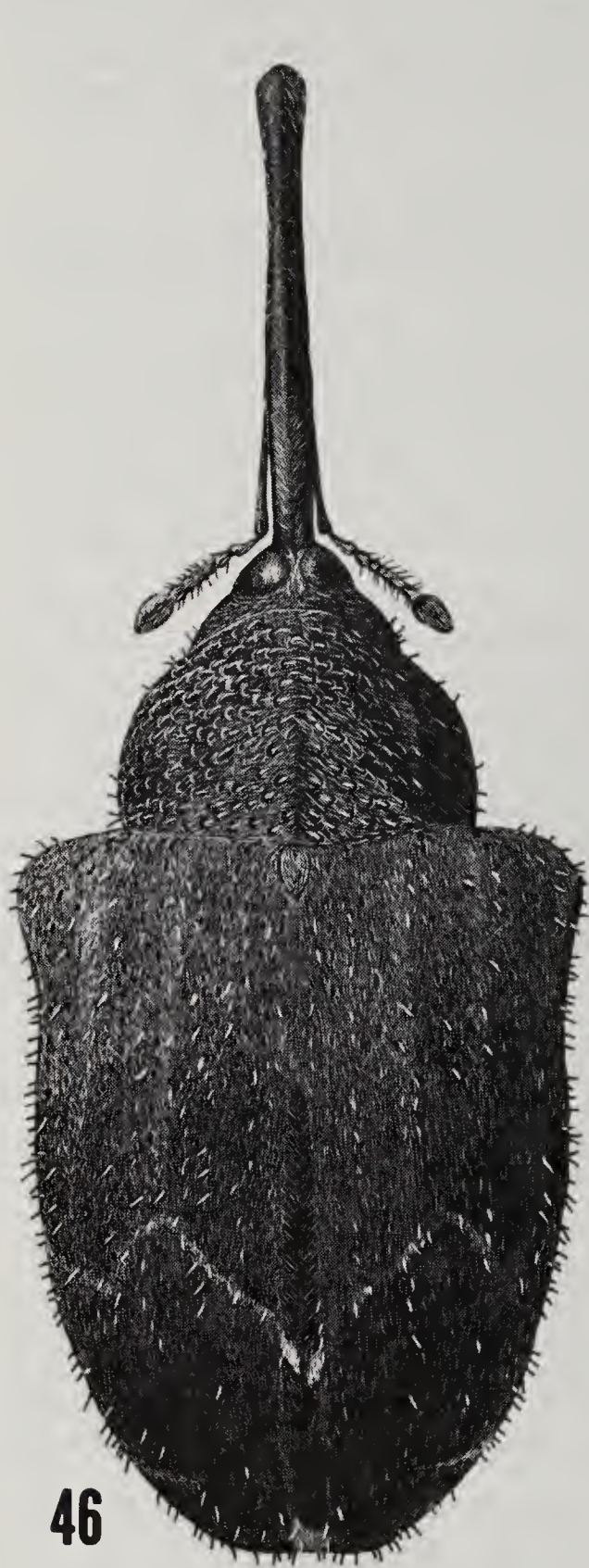
Diagnosis. Adults of the only known species of this genus are much larger than other known Lignyodini. A combination of abdominal features is diagnostic: sternum 5 long, transversely oval, longer than sterna 2-4 combined; sterna 2-4 equally long; and sterna 4-5 fused, suture 4 less distinct than sutures 1-3. Some *Lignyodes* have sternum 5 nearly as long, but with sterna 3 and 4 each much shorter than 2 and with suture 4 no less distinct than sutures 1-3.

Description. Tychiinae: Lignyodini. Large, robust; length from apex of pronotum to apex of elytra ca. 7.5-8.5 mm. *Rostrum:* long, slender, barely arched, convex ventrally at base; scrobe parallel to long axis of rostrum, extended nearly to anterior margin of eye; rostrum in female about $2.5 \times$ length of pronotum, nearly uniformly cylindrical, dorsum nearly smooth, antennal insertion near midpoint; rostrum in male about $1.5 \times$ length of pronotum, dorsoventrally expanded near antennal insertions, dorsum strongly bisulcate, antennal insertion near distal $1/3$. *Antenna:* scape extended nearly to anterior margin of eye, as long as funicle and club combined; funicle 7-segmented, $2 \frac{1}{2}$ times as long as club; club 3 times as long as wide. *Head:* eyes large, oblong dorsoventrally, separated by distance 0.1-0.2 times width of rostrum at antennal insertions. *Prothorax:* coarsely, deeply punctate; interspaces narrow; punctures near midline finer, sparser; midline with fine dorsal carina; procoxal cavities slightly nearer base than apex of prosternum; carinae extended from apical midpoint of each coxal cavity to apex, prosternum concave between; neither apical nor basal intercoxal processes prominent. *Elytron:* humerus and subapical tubercle prominent; sutural interval distinctly carinate in apical $2/3$; interval 3 distinctly raised in basal $3/4$, interval 5 in basal $2/3$, interval 7 in basal $1/2$, interval 9 from humerus to apex; striae punctures coarse, partially obscured by vestiture. *Meso- and Metathorax:* venter except for mesosternum coarsely punctate; mesosternum produced mesally as prominent tubercle, feebly punctate. *Legs:* femora feebly clavate, each armed with minute tooth, tooth obscured by vestiture; tibiae uncinatae. *Abdomen:* sternum 5 longer than sterna 2-4 combined, sterna 2-4 each about equally long; suture 1 slightly curved backward at lateral $1/4$, suture 2 strongly so, sutures 3-4 less strongly so than suture 2; suture 4 less distinct than sutures 1-3; pygidium in male vertical, exposed, with prominent lateral swellings, in female oblique, flat, nearly completely covered. *Median lobe:* asymmetric, twisted.

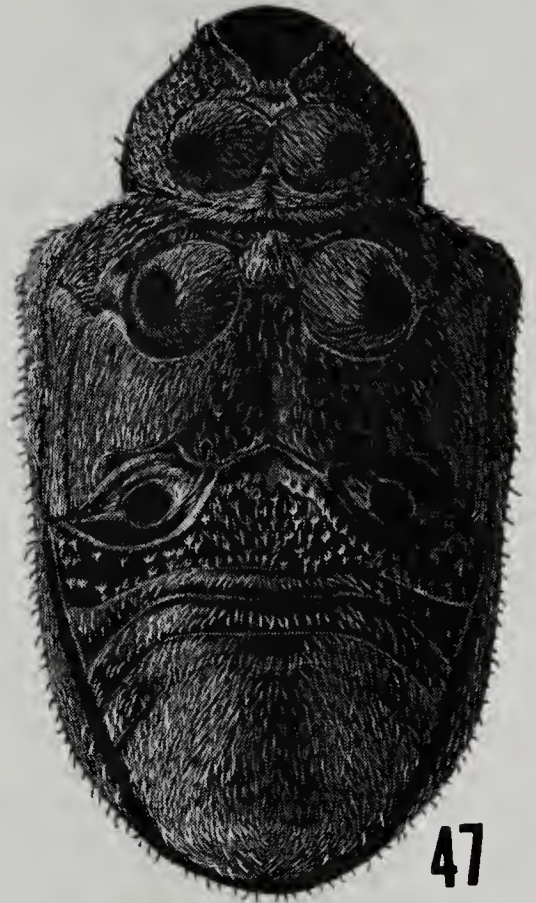
Distribution. Records of this genus are from southern Central America (Costa Rica) and northern South America (Guyana), fig. 52.

Natural history. *Rosella* is one of the few lignyodines known from fruits of Rubiaceae. Larvae develop in fruits of *Sickingia* Willd., bivalved globular pods with numerous winged seeds; they feed by grazing within the pod, each destroying numerous seeds; pupation occurs within the fruit. See Janzen and Wilson (1977) for a more extended discussion of natural history. Larvae of most other lignyodine genera, except for some Neotropical *Lignyodes*, develop internally in the samaras or berries of various Oleaceae, emerge from the fruit, and pupate in the ground.

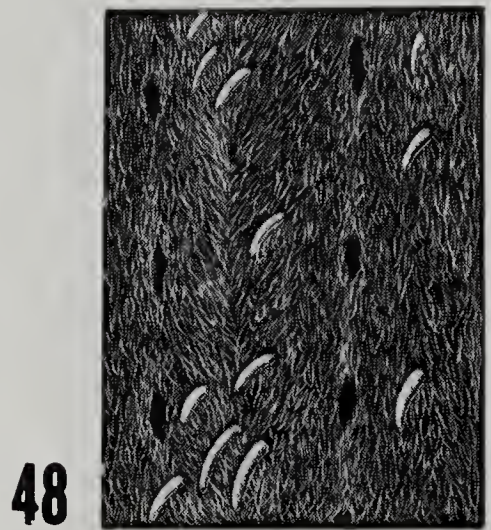
The generic name *Sickingia* has at various times been placed in synonymy with *Simira* Aubl., recently so by Steyermark (1972), but this synonymy does not yet seem to have acquired general acceptance.



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Figs. 46-48, *Rosella sickingiae*: 46) habitus, female; 47) venter, male; 48) detail near base of left elytron.

Relationships. The taxon *Lignyodes* probably is paraphyletic, in that the median lobe of the male genitalia is variously symmetric or asymmetric. If the asymmetric median lobe is synapomorphic within Lignyodini, then *Rosella* is part of a monophyletic assemblage including *Neotylopterus*, *Plocetes*, and some *Lignyodes*, but precise relationships are not clear. The association of *Rosella*, some *Lignyodes*, and possibly *Plocetes* with members of the plant family Rubiaceae probably has phylogenetic significance, but whether the Rubiaceae association is apotypic, plesiotypic, or convergent is not clear.

Etymological note. This distinctive weevil is named for Rose Ella Warner, in recognition of her contributions to knowledge about weevils and for her advice and encouragement. The name *Rosella* is feminine in gender.



Figs. 49-50, *Rosella sickingiae*: 49) lateral view, male; 50) right front femur.

Rosella sickingiae Whitehead, **new species**

Type-material. *Holotype*: male labelled "D. H. Janzen Ex *Sickingia maxonii* 3 Sept. 1970" and "1 mi. N. Puerto Viejo, Sarapiquí Dist., Heredia Prov. COSTA RICA". Type-depository: U. S. National Museum of Natural History, Washington, D. C.; USNM type #73808. *Allotype*: female, same label data as for holotype. *Paratypes*: 16, same date and place as holotype; 21, same place but 17 Feb. 1971; and 1, labelled "Guyane". Paratypes will be distributed to various collections.

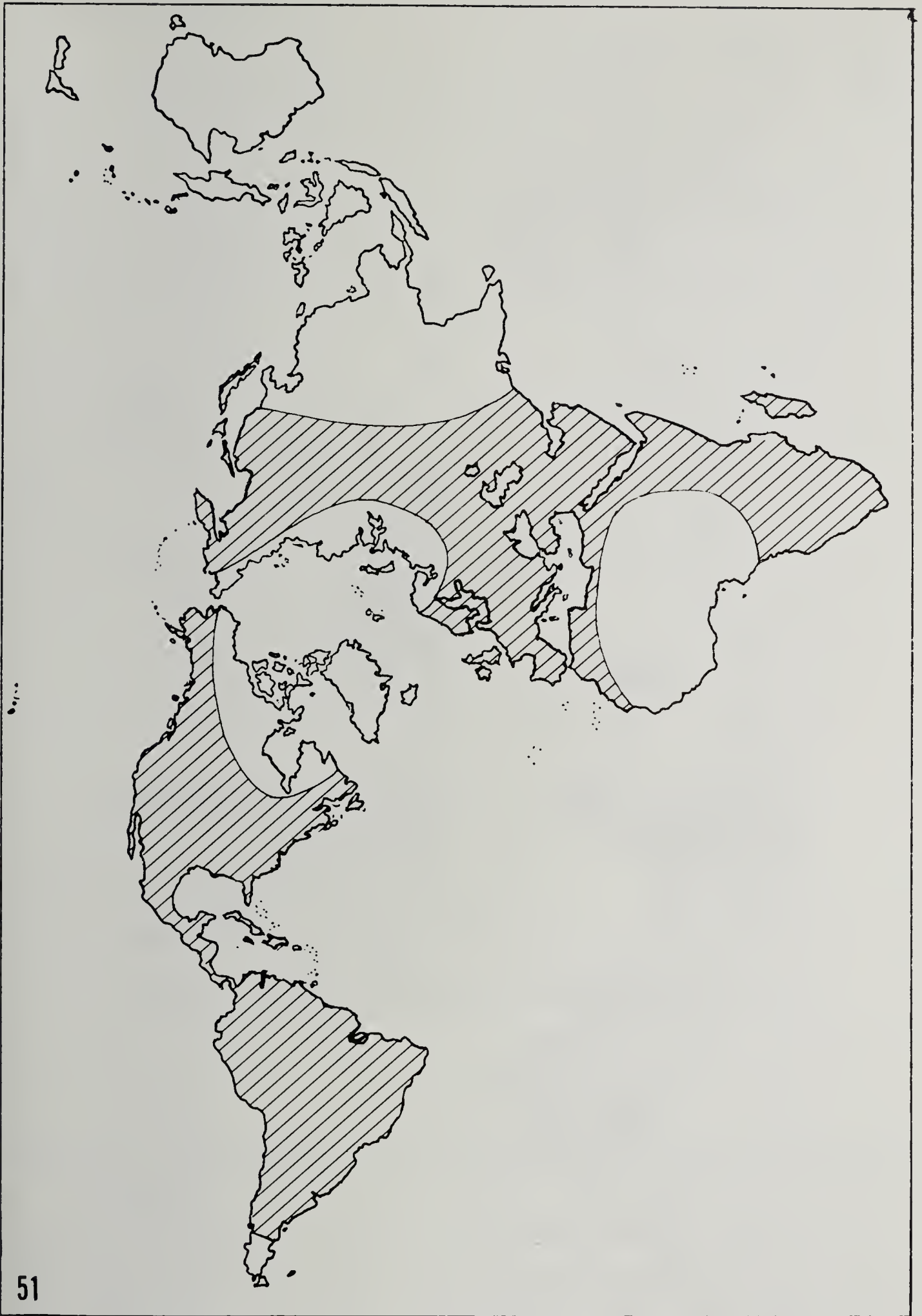
Diagnosis. *R. sickingiae* is the only known species of the genus. The following description, therefore, is an extension of that of the genus, with illustrations of habitus and structural details and with description of color and vestiture.

Description. Length, pronotum+elytron, 7.5-8.3 mm. See illustrations of habitus (figs. 46, 48, 49), head (figs. 20-21), venter (fig. 47), leg (fig. 50), pygidium (fig. 36), spermatheca (fig. 39), spiculum ventrale (fig. 38), and male genitalia (fig. 40-41). Vestiture of generally fine, hairlike, recumbent, pale brown scales; erect, stout, mixed white and brown scales interspersed over much of the body surface, notably along crests of elytral intervals. Strial scales fine, white, appressed. Vestiture on most of body dense, but sparse on apical half of rostrum, on most of prothorax except along midline and expanded basal area, on sterna 1-2, and on middle of sternum 3. Elytron pale brown in basal 1/3, in irregular transverse band near middle, and along sutural interval externally in apical 1/3; dark brown in humeral region, in wide band in front of median pale band, and in apical 1/2; sutural interval in apical 2/3 with broken, velvet like vitta of suberect, nearly black scales. Abdomen with fine hairlike scales on middle of sternum 1, gradually more dense on sterna 2-3, dense on sterna 4-5; suture 4 partially obscured.

NOTES ON ENDAEINE AND ELLESCHINE GENERA

As stated above, our concept of the tribe Endaeini is based on examination of *Ochyromera ligustri* Warner, which was introduced into the eastern United States from the Oriental Region (Warner 1961), and a few other *Ochyromera* and *Endaeus* spp. in the USNM. The genera occur throughout the Oriental and Ethiopian Regions. As noted above, hosts of *Ochyromera ligustri* are all members of the Oleaceae; we have no host data for other endaeines.

We include 2 genera, *Elleschus* Stephens and *Proctorus* LeConte, in the tribe Elleschini. Until Kissinger (1964) placed these genera in Endaeini (Anthonominae), *Elleschus* was traditionally considered a tychiine genus (Lacordaire 1863, Casey 1892, 1910, Blatchley and Leng 1916, Leng 1920, Klima 1934), and North American workers followed LeConte (1876) in assigning *Proctorus* to Tychiinae. *Elleschus* contains some 15 species in North America, the Palaearctic Region, and Australia (Klima 1934). *Proctorus*, with 2 species, is limited to North America. Nearctic *Elleschus* and *Proctorus* are associated with willows (*Salix* spp.), Salicaceae. They bear a general resemblance to each other but their relationships to each other and to other Tychiinae are in question. They differ from the other tychiine genera in having the pygidium completely concealed and in having distinct paired dorsal lobes on the tegmen. These are probably plesiomorphic (primitive) conditions shared with Anthonominae (with which *Elleschus* and *Proctorus* have been associated), Eirrhiniinae (some of which they resemble), and various other curculionid subfamilies.



51

Fig. 51, composite geographic distribution of Tychiini.

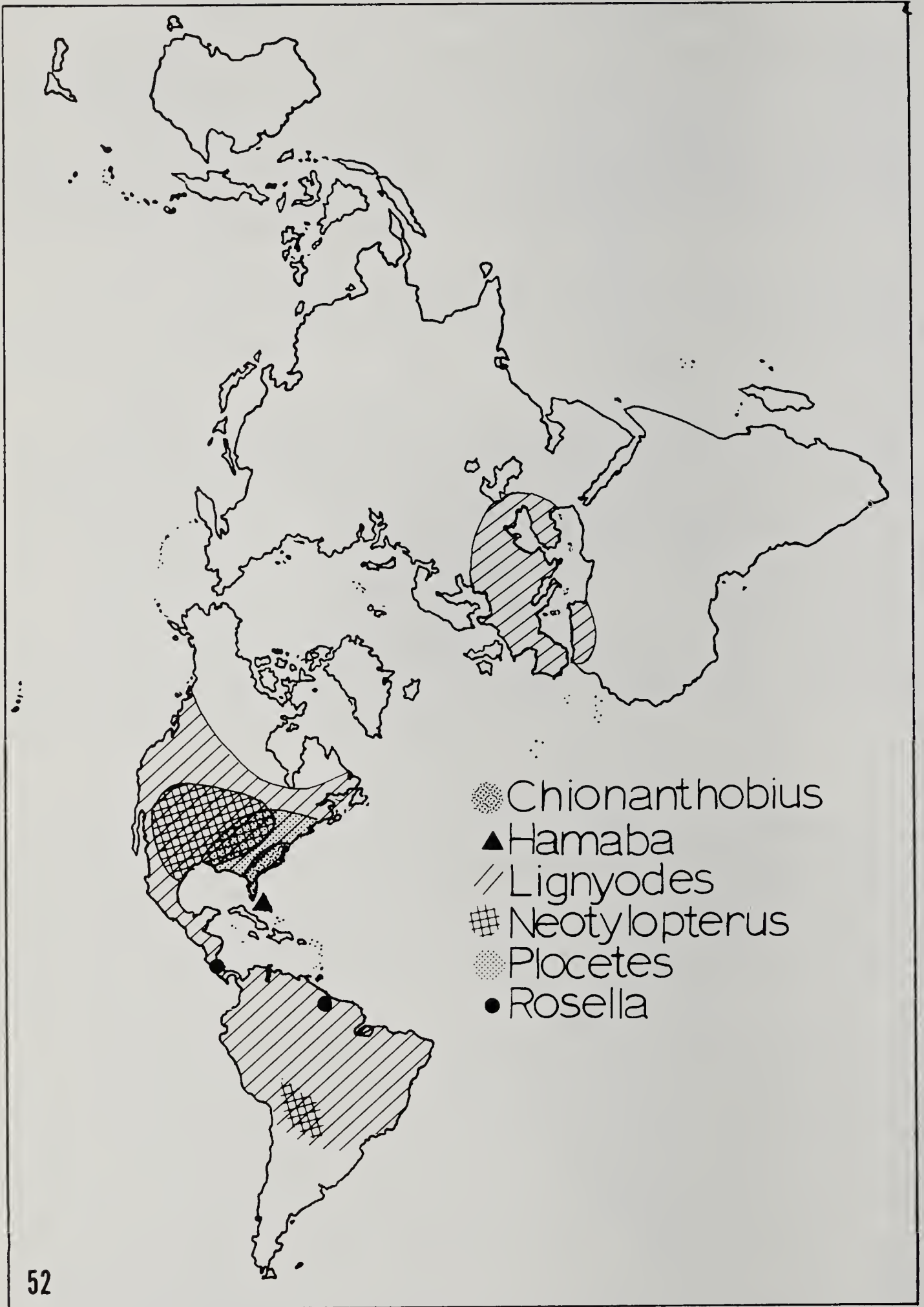


Fig. 52, geographic distributions of genera of Lignyodini.

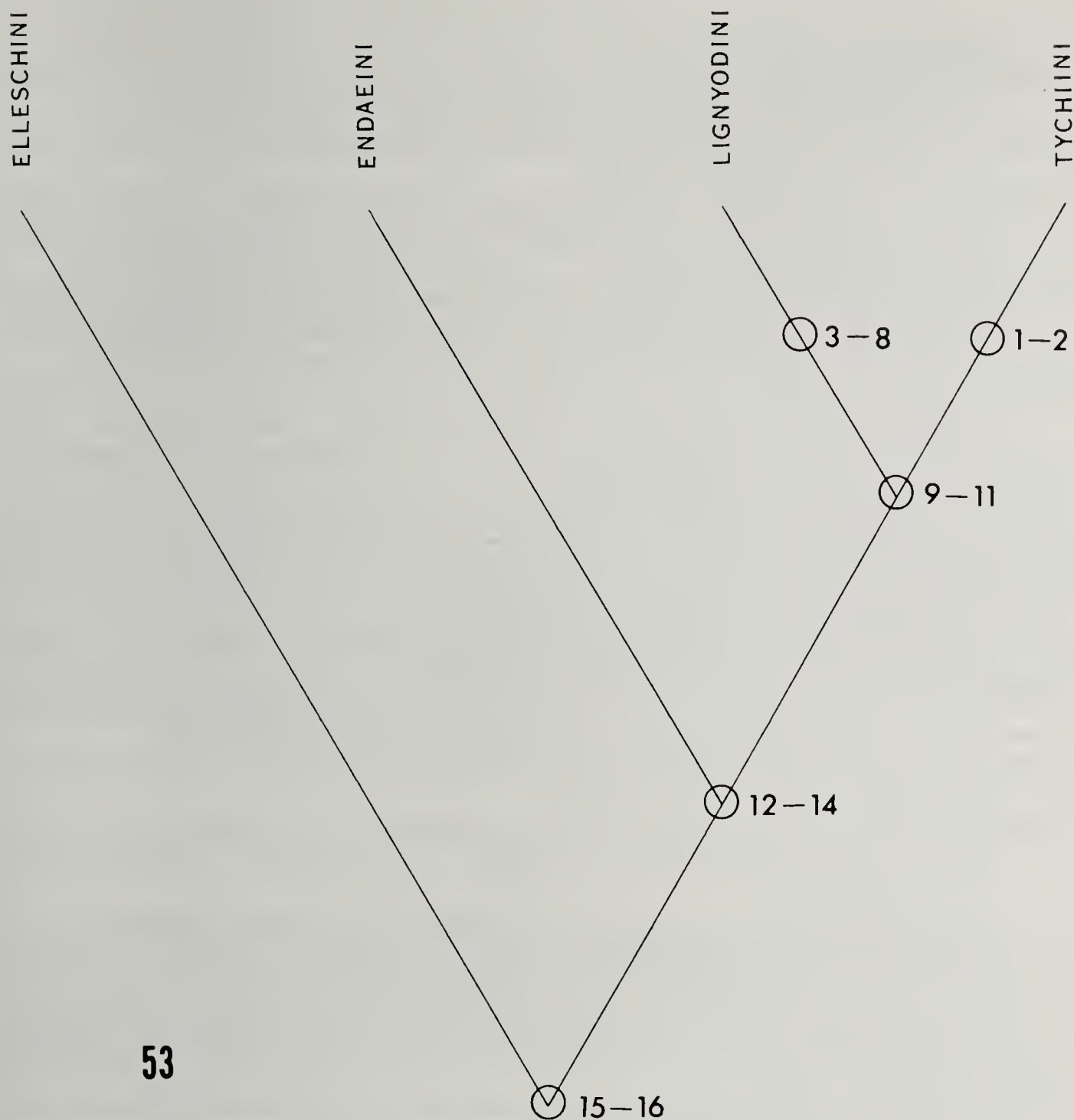


Fig. 53, reconstructed phylogeny of tribes of Tychiinae.

REFERENCES CITED

- BLATCHLEY, W. S. 1916. In W. S. Blatchley and C. W. Leng. Rhynchophora or weevils of North Eastern America. Indianapolis, Nature Publ. Co., 682 p.
- BRUHN, A. F. 1947. The external male genitalia of some Rhynchophora. Great Basin Nat. 8:1-35.
- BURKE, H. R. 1959. Morphology of the reproductive systems of the cotton boll weevil (Coleoptera, Curculionidae). Ann. Ent. Soc. Amer. 52:287-294.
- _____. 1973. Taxonomic relationships and biology of *Macrorhoptus* (Curculionidae). Coleop. Bull. 27:175-181.
- _____. 1976. Bionomics of the anthonomine weevils. Ann. Rev. Ent. 21:283-303.
- CASEY, T. L. 1892. Coleopterological notices, IV. Ann. N.Y. Acad. Sci. 6:359-712.

- _____. 1910. On some new species of Balanini, Tychiini and related tribes. *Can. Ent.* 42:114-144.
- CHAMPION, G. C. 1902. *Biologia Centrali-Americana, Insecta. Coleoptera (Curculionidae: Curculioninae)* 4(4):1-144.
- DEJEAN, P. F. M. A. 1835. *Catalogue des coléoptères de la collection de M. le comte Dejean* 4:257-360.
- DIECKMANN, L. 1970. Die paläarktischen *Lignyodes*-Arten, einschliesslich einer neuen Art aus der Slowakei (Coleoptera, Curculionidae). *Ent. Nachrichten* 14(7):97-104.
- JANZEN, D. H., AND D. E. WILSON. 1977. Natural history of seed predation by *Rosella sickingiae* Whitehead (Curculionidae) on *Sickingia maxonii* (Rubiaceae) in Costa Rican rainforest. *Coleop. Bull.* 31:19-23.
- KISSINGER, D. G. 1962. The curculionid beetles collected on the Explorers Club-American Museum of Natural History Entomological Expedition to Yucatan, Mexico, 1952 (Coleoptera, Curculionidae). *Amer. Mus. Novit.* 1086:1-28.
- _____. 1964. Curculionidae of America north of Mexico. A key to the genera. *Taxonomic Publ.*, South Lancaster, Mass., 143 p.
- KLIMA, A. 1934. Curculionidae: subfamily Tychiinae. *In* S. Schenkling (ed.), *Coleopterorum catalogus* 29 (pars 138):1-61.
- LACORDAIRE, T. 1863. *Histoire naturelle des insectes. Genera des Coléoptères, vol. 6, Curculionides.* Paris, 637 p.
- LECONTE, J. L. 1876. *In* J. L. LeConte and G. H. Horn. *The Rhynchophora of America north of Mexico.* *Proc. Amer. Phil. Soc.* 15:1-455.
- LENG, C. W. 1920. *Catalogue of the Coleoptera of America, north of Mexico.* Mount Vernon, N. Y., 470 p.
- MORIMOTO, K. 1962a. Comparative morphology and phylogeny of the superfamily Curculionoidea of Japan. *J. Fac. Agric., Kyushu Univ.*, 11(4):331-373.
- _____. 1962b. Key to families, subfamilies, tribes and genera of the superfamily Curculionoidea of Japan excluding Scolytidae, Platypodidae and Cossoninae. *J. Fac. Agric., Kyushu Univ.*, 12(1):21-66.
- SCHENKLING, S., AND G. A. K. MARSHALL. 1936. Curculionidae: subfamily Prionomerinae. *In* S. Schenkling (ed.), *Coleopterorum catalogus* 29 (pars 150):1-11.
- SCHÖNHERR, C. J. 1833. *Synonymia Insectorum . . . Genera et species curculionidum, cum synonymia hujus familiae. Species novae aut hactenus minus cognitae, descriptionibus a Dom Leonardo Gyllenhal, C. H. Boheman, et entomologis aliis.* Paris, 1(1):1-381.
- SHERBORN, C. D. 1922. *Index animalium. Section 2:*1-7056.
- SLEEPER, E. L. 1954. New Rhynchophora. I. (Coleoptera, Anthribidae and Curculionidae). *Ohio J. Sci.* 54(2):117-125.
- STEYERMARK, J. A. 1972. Rubiaceae. *In* B. Maguire *et al.* *The botany of the Guayana Highland. Part IX.* *Mem. N. Y. Bot. Garden* 23:1-832.
- THOMSON, C. G. 1859. *Skandinaviens Coleoptera synoptiskt bearbetade.* Vol. 1. Tryckt, Lund. 290 p.
- VOSS, E. 1958. Ein Beitrag zur Kenntnis der Curculioniden in Granzgebiet der Orientalischen zur Paläarktischen Region (Col., Curc.). *Decheniana, Beihefte* 5:1-139.
- WARNER, R. E. 1961. The genus *Ochyromera* new to the Western Hemisphere, with a new species and additions to the Junk-Schenkling *Coleopterorum Catalogus.* (Curculionidae: Prionomerinae, Endaeini). *Coleop. Bull.* 15:121-124.
- _____. In press. Description of a new species of *Phyllotrox* infesting seeds of *Acer grandidentatum*, with new synonymy and a note on *Euclyptus* (Coleoptera: Curculionidae: Eirrhiniinae). *Great Basin Naturalist.*